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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,232	10/16/2001	Mikio Matsuda	03-010	3656

23400 7590 03/25/2003

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EXAMINER
LOPEZ, FRANK D

ART UNIT	PAPER NUMBER
3745	

DATE MAILED: 03/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/977,232	MATSUDA ET AL.	
	Examiner	Art Unit	
	F. Daniel Lopez	3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12* is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *6 Jan 2003* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Response to Amendment

Applicant's arguments filed January 6, 2003, have been fully considered but they are not deemed to be persuasive.

Applicant argues that the outer race (66) of Abousabha et al is non-rotatable, and therefore the constraining member does not have to prevent it from rotating. The question is why is the outer race non-rotatable? Clearly, there are bearings (92, 94) between the outer race and the orbiting member (62), allowing the outer race to remain stationary while the orbiting member rotates. Clearly, the outer race is locked together with the swing member, but there is nothing preventing the swing member from rotating. Therefore, the only elements preventing the swing member and the outer race from rotating is the constant velocity joint, connected to the constraining member.

Applicant argues that Terauchi does not disclose a constraining member or a pin engaged with holes on the first and second rotating members. Clearly applicant is mistaken. Figure 1 clearly shows a constraining member (31), and a pin (e.g. 341a) engaged in holes (e.g. 352a; not numbered, respectively) in the first and second rotating members.

Applicant argues that the examiner is asserting that a skilled artisan would replace the housing of Terauchi with the housing of Abousabha et al. Applicant is mistaken. The combination results in the constant velocity joint of Abousabha et al being replaced by the supporting mechanism of Terauchi, which includes the first and second rotatable members. Furthermore, the motivation to combine is clearly taught by Terauchi, since Terauchi teaches the equivalence of these two joints.

Applicant argues that the combination of Abousabha et al and Terauchi would result in an inoperable device. Applicant is correct. That is why the combination was modified to use a different mechanism to vary the displacement. Specifically, the displacement is varied be varying the pressure in the crankcase, as taught by Abousabha et al. The resulting pump has the crankcase pressure biasing the swing member against the constraining member, and the spring biasing the constraining member against the swing member; therefore the pins should not fall out of the holes.

Applicant argues that the combination of Mitchell and Terauchi does not meet the limitations of claims 1, 2 and 8, since the shaft 36 does not have sufficient stroke to enable plate 51 to function as a variable displacement member. Claims 1, 2 and 8 do not claim anything related to a variable displacement member, and therefore this argument is moot.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 11 line 4 "defined between said cylinder bore and said piston" should be –enclosing said swing member--, to agree with the specification (e.g. page 11 third full paragraph).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 8 and 10 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Terauchi.

Claim Rejections - 35 USC § 103

Claims 1 and 3-11, inasmuch as they are definite, are rejected under 35 U.S.C. § 103 as being unpatentable over Abousabha et al in view of Terauchi and Mitchell. Abousabha et al discloses a variable displacement fluid pump comprising a piston (26) reciprocating in a cylinder bore (28) in a housing; an orbiting member (62) integrally

rotating with a shaft (36), rotatably supported in the housing and a generally keyed (162) cylindrical constraining member, and including a slant plane slanting with respect to the shaft an a changeable angle; a ring disc type swing member (24) connected to the slant plane through a thrust bearing (98), and swinging with rotation of the orbiting member to reciprocate the piston; a constant velocity type swing support mechanism (64) including the constraining member (22) axially movable along a centerline in the housing and constraining a first rotatable member (66) from rotating about the centerline, but allowing the first rotatable member to rotate about first and second axes, each perpendicular to the centerline and crossing over each other; with the swing member connected to the first rotatable member; wherein there is a displacement capacity sensor (143) detecting the capacity based on an amount of displacement of the constraining member in a similarly shaped hole in the housing; wherein the displacement of the pump is adjusted by a motor (138) adjusting an axial position of the constraining member; and discloses that it is well known to vary the displacement of a pump by controlling a pressure in the crankcase (column 1 line 24-32); but does not disclose that the constraining member constrains the first rotatable member from rotating about the centerline, and allowing it to rotate about the first axis, by a pin engaged in holes formed in the first rotating member and the constraining member; with a second rotatable member connected to the first rotatable member, through a pin engaged in a hole in the first rotating member, such that it rotates about the second axis, with the swing member connected to the second rotatable member; or that the constraining member has ether a polygonal or a gear cross section and is inserted into the corresponding shaped hole in the housing.

Since Abousabha et al teaches adjusting the pump displacement by a motor adjusting an axial position of the constraining member and by adjusting a pressure in the crankcase; it would have been obvious at the time the invention was made to one having ordinary skill in the art to adjust the pump displacement of Abousabha et al by adjusting a pressure in the crankcase, as a matter of engineering expediency.

Terauchi teaches, for a fluid pump comprising a piston reciprocating in a cylinder bore in a housing; an orbiting member (25) integrally rotating with a shaft (20), rotatably supported in the housing, and including a slant plane slanting with respect to the shaft; a ring disc type swing member (27) connected to the slant plane through a thrust bearing (28), and swinging with rotation of the orbiting member to reciprocate the piston; the equivalence of a constant velocity type swing support mechanism including a generally cylindrical constraining member (50, fig 7) axially movable along a centerline in the housing and constraining a first rotatable member (53) from rotating about the centerline, but allowing the first rotatable member to rotate about first and second axes, each perpendicular to the centerline and crossing over each other; with the swing member connected to the first rotatable member; that the shaft is supported by the housing without being supported by the constraining member;

and a swing support member including a constraining member (31) constrains a first rotatable member (34) from rotating about the centerline by a pin (shown on end in fig 1) engaged in holes formed in the first rotating member and the constraining member (hole in constraining member is 312 a, 312b), and allowing it to rotate about the first axis; with a second rotatable member (35) connected to the first rotatable member through a pin (34a, 34b) engaged in a hole in the first rotating member, such that it rotates about a second axis, with the swing member connected to the second rotatable member.

Since the swing support mechanism of Abousabha et al and Terauchi are functionally equivalent in the piston art, as explicitly taught by Terauchi; it would have been obvious at the time the invention was made to one having ordinary skill in the art to support the shaft by the housing of Abousabha et al without being supported by the constraining member, as taught by Terauchi, and replacing the swing support mechanism of Abousabha et al with a swing support member including a constraining member (31) constrains a first rotatable member from rotating about the centerline, and allowing it to rotate about the first axis, by a pin engaged in holes formed in the first rotating member and the constraining member; with a second rotatable member connected to the first rotatable member, through a pin engaged in a hole in the first

rotating member, such that it rotates about a second axis, with the swing member connected to the second rotatable member, as taught by Terauchi, as a matter of engineering expediency.

Official notice taken that it is well known to allow a first member to slide in a hole in a second member without rotating, by making the cross section of the first member and the hole is a gear shape or a polygonal shape. It would have been obvious at the time the invention was made to one having ordinary skill in the art to make the constraining member and corresponding shaped hole of Abousabha et al have ether a polygonal or a gear cross section, as a matter of engineering expediency.

Claims 1, 2, 8 and 10 are rejected under 35 U.S.C. § 103 as being unpatentable over Mitchell in view of Terauchi. Mitchell discloses a fluid pump comprising a piston (66) reciprocating in a cylinder bore (33) in a housing; an orbiting member (28) integrally rotating with a shaft (25), rotatably supported in the housing and including a slant plane slanting with respect to the shaft; a ring disc type swing member (51) connected to the slant plane through a thrust bearing (52), and swinging with rotation of the orbiting member to reciprocate the piston; a swing support mechanism including a constraining member (36) axially movable along a centerline in the housing and constraining a first ring shaped rotatable member (41) from rotating about the centerline, but allowing the first rotatable member to rotate about a first axis, perpendicular to the centerline; with the swing member connected to the first rotatable member; but does not disclose a second rotatable member connected to the first rotatable member such that it rotates about the second axis, with the swing member connected to the second rotatable member.

Terauchi teaches, for a fluid pump comprising a piston reciprocating in a cylinder bore in a housing; an orbiting member (25) integrally rotating with a shaft (20), rotatably supported in the housing, and including a slant plane slanting with respect to the shaft; a ring disc type swing member (27) connected to the slant plane through a thrust bearing (28), and swinging with rotation of the orbiting member to reciprocate the piston; a swing support mechanism including a constraining member (31) axially movable along

a centerline in the housing and constraining a first rotatable member (34) from rotating about the centerline, but allowing the first rotatable member to rotate about the first axis, perpendicular to the centerline; with the swing member connected to the first rotatable member; that the swing member is connected to the first rotatable member through a second rotatable member (35) connected to the first rotatable member such that it rotates about a second axis.

Since the connection between the swing member and the first rotatable member of Mitchell and Terauchi are functionally equivalent in the piston art; it would have been obvious at the time the invention was made to one having ordinary skill in the art to connect the swing member to the first rotatable member of Mitchell with a second rotatable member such that it rotates about a second axis, as taught by Terauchi, as a matter of engineering expediency.

Conclusion

Claim 12 is allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Lopez whose telephone number is (703) 308-0008. The examiner can normally be reached on Monday-Thursday from 6:30 AM -4:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look, can be reached on (703) 308-1044. The fax number for this group is (703) 872-9302. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0861.

F. Daniel Lopez
Primary Examiner
Art Unit 3745
March 24, 2003